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ECONOMY OF THE WAR MACHINE PART IV. CHAPTER ONE (PART A)

ECONOFICTION DELEUZE/GUATTARI, DERIVATIVE COMMUNISM, FINANCE, MARXISM, WAR MACHINE

Yeah, so I don't want to tell you what to do, but given where we're going to be going, it might be good to briefly check in with the updated versions of this or this -but if not those, then at least look at this (if you want to -again, *you do what you want to*; I'm not telling you *what* to do, I'm telling you what you *can* do if you *want* to do it).

In *A Thousand Plateaus* D&G propose a new model of economy. No biggie. This project, the project of *On Dromocracy* (aka "Economy of the War Machine") is, at our leisure, just kind of explaining what exactly this model involves. Here's part a of Chapter One of Part IV of *On Dromocracy*.

Technological Issue. Interminable Deterritorialization

(Continuous Recalibration) (part a)

D&G draw our attention to the important technological issue concerning nomadic distribution. This is the issue of interminable deterritorialization. We believe the issue is best addressed through an exposition of the financial economic pricing method of continuous recalibration, because of the latter's intimate ontological relation to dynamic hedging, or dynamic replication. That is to say, continuous recalibration proves a ready-made method for interminable deterritorialization –we need only be capable of, and willing to 'tweak the Greeks', i.e. to map, think through and on and with their concepts; to respect but probe and examine them, to tinker on their content, to see what more they can say; or as D&G say, to execute a little decalcomania.[1]

However, before one elects to 'tweak' anything whatsoever, some knowledge of the pre-tweaked version is nice to have. For this reason we should explain the Greek letters, first with a special focus on delta (Δ), and later delta's and the other Greeks' relation to implied volatility, and in between that, the method for interminable deterritorialization that is the *becoming* delta-zero of continuous recalibration. This will serve us when examining our behavioral issue, wherein we itemize the intersecting desires of hedging-speculating-arbitraging –the simultaneous disposition of the denizens *qua* operators of a war machine economy, when dynamically arranging themselves into clusters of exotic options (CEOs), locally, and implementing a universal synthetic CDO

(USCDO), globally.

Interminable Deterritorialization

Let us situate the technological issue of interminable deterritorialization in its proper textual and ontological context. Interminable deterritorialization is a class of deterritorialization, one whose issue abides in the more general question of how sedentary distribution and nomadic distribution ontologically differ in kind.

D&G note that an important element of the issue concerning nomadic distribution involves the question of '[what] is a principle and what is only [its] consequence'?[2] What do they mean? Obviously there's no cause here for intellectual dogmatism on our part; no feigned sense of sobriety, nor obtuse commitments to some unyielding ideology, from whose departure we feel compelled to greet with derision. Those days are over, nothing could be less in the spirit of D&G. Rather, let us simply admit that nomadic distribution, like sedentary distribution, does concern itself with space (markets), it does concern itself with objects (assets) in space, it does concern itself with territories (property and property relations), with zones and regions, terrains and taxes. Yes, of course, nomadic distribution –like all distribution– concerns itself with what D&G call 'points and paths'. Nomadic distribution, like sedentary distribution, 'follows customary paths'; it too goes 'from one point to another', it is not 'ignorant of points'.[3] Rather, D&G note that their differences pivot on the fact that in nomadic distribution, the points that determine the paths 'are subordinated to the paths they determine' –and that, importantly, '[this is] the reverse of what happens with the sedentary': for in a nomadic mode of distribution 'a point is reached only in order to be left behind; every point is a relay and exists only as a relay'.[4] So while it's the case that every 'path is always between two points', in nomadic distribution the 'in between' of the paths takes up a consistency unto itself, 'enjoys both an autonomy and a direction of its own.' This is why D&G say that 'the life of the nomad is the *intermezzo*'. [5] the nomad is always 'in between' that which is made, but this very in between now constitutes a substance in itself.

We will illustrate that this mode of distribution finds its commensurate pricing technology in the method of interminable deterritorialization that is continuous recalibration. It is also true that a becoming whose substance lies 'in between' two points will *in practice* demonstrate the abstract principle of the Cantor set we discussed in Part III. The Cantor set comprises an infinitely many dust of points, whose perpetual becoming produces a substance of space between its points –the principle of its activity is a continuous repetition of division, so that its set is continuously becoming zero, yet always remains embedded in a finite space, it is both infinitely numerous but infinitely sparse.



However, let us also pause to encourage our reader to not fail to observe that Chapter 12 opens these technically-grounded but otherwise creative ruminations with strict and sober definitions of two concrete problems. The first problem is institutional; the second is intellectual, or more perhaps appropriately thought of, in our opinion, as we noted, as behavioral. Their formal definition:

'Problem I. Is there a way of warding off the formation of a State apparatus (or its equivalents in a group)? {the institutional problem}; and

'Problem II. Is there a way to extricate thought from the State model'? {the behavioral problem}[6]

We should understand that D&G's invocation of these problems amounts to a reminder, and that reminder is clear, returning us all the way back to Ch.1 of *TP*. D&G are recalling their prior commitment to saying "No" to both the arborescent (centralized) and fascicular (capitalist) modalities of the distribution of flows, and "Yes" and "How" to rhizomatic (war machine) flows.[7] Any hesitation by a reader of *TP* to understand the passages on nomadic distribution in this light, will fail to understand the proactive exercise required of us herein. For these are a prefatory set of problems outlined by D&G, for their readers, to whom they are appealing to help them think through and resolve. And only with these two problems defined and elaborated, and now opened up, can D&G then move deeper into Chapter 12's dissertation on the materialism of nomadic distribution, whose general objective is to detail some related basic, affiliated problematics –and which again, as we have already argued, are principally technological, institutional, and then behavioral as well– when moving from ontology to economy, i.e. when moving from an exposition of the material wagers of nomadic distribution towards an economy of the war machine.

Moreover, at this textual point in Chapter 12, whereby D&G have just outlined these two problems, they now make sustained invocation to the notion of *deterritorialization*. Or rather, they make a special invocation to interminable deterritorialization –that rare mode of deterritorialization capable of immunizing itself from any counter- or reterritorialization; as if now providing their reader with a cue; as if appealing to, or pleading with us to help them think through *as now a specifically economic problematic* the issue concerning nomadic distribution, but now equipped with what we believe is best understood as the financial economic,

practical-technological issue of interminable deterritorialization. Indeed, D&G are now enjoining their reader to search out, (re)engineer, or discover an instrument for its operation.

Optionality

Continuous recalibration is a practical method for interminable deterritorialization. To understand its prospective significance for dromocracy, our reader must understand the valuation model to which its technology originally attaches itself, namely, Black-Scholes-Merton (BSM).[8]

Even those readers paralyzed by anxiety about their lack of knowledge of financial economics will intuitively grasp that uncertainty pervades an attempt to ascertain what *will have been* the value of an asset in the future, relative to its subsequent past value now in the present. Can this even be done? BSM affirmed that it can. Initially BSM announced itself as a risk-neutral, nonarbitrage model for pricing options. We will later examine the importance that BSM isn't quite used like this today. Let us presently note that BSM is indeed a nonarbitrage model, albeit one whose condition of possibility and goal *is* arbitrage. However, BSM asserts that when deploying its partial differential equation to determine the value of an option, i.e. to know in the future what will have been the value of an option today, an operator needs to know four things:

- (i) the option's time to maturity (T)
- (ii) the riskless interest rate (r)
- (iii) the referent price (S_0)
- (iv) the volatility of referent price (σ)

The first three parameters are easily found. They're either quoted in the market, or in the case of the first parameter, i.e. time to maturity, which is the expiration date of the option, is embedded in the terms of the contract itself. The fourth parameter is a bit trickier. Is to know volatility perhaps even ontologically impossible?

If the market proceeds in a random walk, so too are plots of price movements of its assets. This means that volatility is stochastic, nonconstant, and therefore this fourth parameter an operator needs to know is deterministic but chaotic. One quickly realizes that any data on 'past' or 'historical volatility'[9] is available but not dispositive for knowing future price movements. Any attempts by a BSM operator to divine 'future volatility' amounts to an attempt to solve a differential equation by way of a nondifferentiable function (*it can't be done). For this reason, today operators retain BSM, but invert its equation to iterate implied volatility. We will end our consideration of our technological issue (to be presented in future posts) by opening up, to briefly peer inside, the peculiar but potentially profound material implications of *implied volatility* –which we believe is an intensive economic property giving rise to historical volatility, at the same time that actualization of the latter covers or cancels it out. Moreover, if we heed the full Deleuzian-dynamical systems theoretic sense of the term 'intensive', it produces some conviction that implied volatility is readily deployed as a fungible pricing mechanism, far more commensurate with the economic *institutions* and endemic *behaviors* of the denizens of a dromocracy, than is that placid, one-dimensional, extensive medium of exchange we call 'money'.

We will introduce options without presuming much background on our reader's part.[10]

Options comprise a class of financial derivatives, and financial derivatives comprise a class of financial assets. In dromocracy, the exchange of exotic options comprise the principal class of exchange. And communities, or clusters of exotic options (CEOs), are one of its two economic institutions.

The standard, if only sometimes correct definition of a financial derivative is an asset whose value derives from some other asset, often called a referent.[11] We're supposed to tell you this; but it need not overly concern us, and at any rate is, like the principals of Euclidean geometry, not so much always wrong as only sometimes true. Rather our concern is that an option is a nonlinear financial derivative that produces a contingent claim; and that holding an option gives the option holder the right to do something by a certain date, it gives the option holder choice, or *optionality*. Taleb tells us that 'optionality is a broad term used by traders to describe a nonlinearity in the payoff of an instrument'[12], which will be especially compelling to a reader who is now beginning to cognitively synthesize that *rhizomes-nonlinearity-chaos-derivatives* are the crucial constitutive components of dromocracy.

There are two kinds of options. There are *call options*, the holding of which gives one the right to acquire something at a certain price, known as the 'strike price', on or by a future date, known as 'the maturity' or 'expiration'. And there are *put options*, the holding of which gives one the right to part with something at a strike price on or by a future date. The terms 'European' and 'American' have nothing to do with where the options are written, read, or otherwise exchanged. Rather, European options can only be exercised on the day of their expiration, while American options can be exercised any time between their inception and expiration.

In both finance and a dromocracy we call *operators* those persons exchanging options. Operators trade optionality. There are two types of operators: *writers* and *readers*. To write optionality is to sell an option for a fee to a reader, who now holds the right to choose to acquire some pre-agreed to asset, whether an object or service, at a predetermined price, if certain mutually-pre-agreed to conditions are met either at the end or during the life of the option. To *read* optionality is to buy an option for a fee from a *writer*, who now accepts the liability to deliver some pre-agreed to asset, whether an object or service, at a predetermined price to the reader, if certain mutually pre-agreed to conditions are met either at the end or during the life of the option. Writers, then, issue optionality for a price, and accept liability if conditions written in the option are met. Readers accept optionality with a price, and exercise their choice if conditions written in the option are met.

Lastly, there are two classes of options: vanillas and exotics. Vanillas are standardized options, and conventionally-structured. Exotics are bespoke options, and have non-conventional structures. It's worth noting that pricing exotics can quickly become quite complicated in ways not conquerable by however-sophisticated modeling techniques, therefore generating available arbitrage opportunities for its operators. Exotics are the main classes of options exchanged in dromocracy.

BSM's original assertion is that in theory it's possible to construct a riskless portfolio, comprised of a position in options and some referent, such as stocks (though it could be any generic asset). For case-specific purposes, we will henceforth call this portfolio a 'package'.^[13]

Scholes says, 'Black's and my discovery was how to price options and to provide a way to manage risk.'^[14] Derman and Taleb remind us this doesn't mean that options are rendered riskless assets, or that an option's actual price movements are in any way predictable, periodic, or nonstochastic.^[15] Rather, the success of BSM's pricing model pivots on hedging. And not just any hedging, but *delta hedging* –whose wager is that any price movements in an option position are offset by price movements in a correlative stock position (or other referent), and vice versa: and *that* these price movements offset one another means that the delta of the package at any given point in time, while not *strictly* zero, is nonetheless always striving towards it, tending towards it, ever attempting to move yet closer to zero. The delta of the package is perpetually a *becoming-zero*.

Let us introduce this logic, then back up and unpack it:

How does the package chase delta-zero? By becoming delta-neutral. By always desiring to move yet faster towards zero.

But what about stochastization and nonlinearity? An operator is needed to continuously recalibrate the delta of the package back towards its becoming-zero.

What is this recalibration? How does an operator continuously recalibrate? With dynamic replication.

But what is dynamic replication? How does an operator dynamically replicate? With the Greeks: with *delta* (Δ), *gamma* (Γ), *vega* (V), *theta* (Θ), and so on.

This is the logic. Let us unpack it.

In our next post we will first consider delta. It is the first among Greeks, literally. It's the first mathematical derivative of the product with respect to the referent, and the most important parameter for understanding dynamic replication through continuous recalibration.^[16] BSM provides a formula for knowing delta. *Delta measures the ratio of change between the price of an option and the price of a stock*. Thus, in a simple linear Euclidean world, i.e. a world without drift, in which volatility remains constant, and therefore a world wherein the value of delta remains invariant, achieving a riskless package by delta-hedging with BSM would be sufficient: an operator would use BSM to tell her the number of units of stock (or other referent) relative to options she must hold to deterritorialize her package from all risk. And constructing her riskless package by way of BSM would merely be a matter of *static, linear, delta hedging*, in a fixed, Euclidean, linear world.

Options, however, are thoroughly nonlinear. And assets in a nonlinear world require dynamic hedging, which means we will need to consider some second-order derivatives. To delta hedge is to hedge on an ongoing, rather than static or one-time, basis. To dynamically-hedge with second-order derivatives is to continuously recalibrate, a financial economic method for interminably deterritorializing one's package always back towards a zero, which it will only ever asymptotically approach. To continuously recalibrate is to dynamically replicate. So dynamic replication by method of continuous recalibration –this is a matter of interminable deterritorialization, an activity of intermittency isomorphic to the becoming that is the Cantor set, for it is infinitely-becoming zero, yet now comprises a substance in itself.

That dynamic replication requires second-order derivatives, such as for instance gamma, theta, vega, and rho; that these Greeks lend us analytic purview into the multidimensionality of risk; and that continuous recalibration is understood to provide us with a method for interminable deterritorialization, yes, but moreover one whose technology allows for an operator or set of operators to comeingle with deterministic chaos –this is our interest in continuous recalibration for the purposes of dromocracy.

In our next post, we will consider two simple examples, which we will cull and rework from Hull. These will serve to illustrate the

basic dynamics of this technology, which we must first understand before understanding the ontological significance of implied volatility as a prospective pricing mechanism in a war machine economy, or more fully how continuous recalibration comprises a dynamic pricing method for its operators. Then, we can renter D&G's wager on a rhizomatic model of economic flows, and see that continuous recalibration allows its operators, the denizens of dromocracy, to sit poised on the edge of nonlinearity, comingling with chaos, autonomous, healthy, viable, abiding in nomadic distribution.

[1] The standard financial economic concept of the "Greeks" (for examples, see Taleb (1996) pg. 10, and generally Ch.7-11; and Hull (2009) pg. 357, and generally Ch. 17) is often defined as *a means of measuring the sensitivity of the price of an option with respect to a variety of parameters*, but is better defined as the *relationship* between an option price and any number of parameters. Before we 'tweak' the Greeks, let us observe that risk is multidimensional, that dimension is not a geometric invariant; and so in financial economics each Greek letter (e.g. delta, gamma, theta, rho, etc.) purports to represent a different dimension of risk; so that an operator managing her Greeks will always be seeking to hedge her exposure to the multidimensional risks whose differential relations and amounts of relations perpetually supervene on her portfolio, affecting its value, and therefore it's return.

[2] TP Ibid pg. 380

[3] Ibid pg. 380

[4] Ibid pg. 380

[5] Ibid pg. 380

[6] Ibid pg. 356, 374

[7] For example, recall the problem definition, original to Chapter 1: 'The problem of the war machine..is [do we] need a general for n individuals to fire in unison? The solution without a General is to be found in an acentered multiplicity possessing a finite number of states with signals to indicate corresponding speeds.' Ibid pg. 17

[8] Fischer Black and Myron Scholes, "The Pricing of Options and Corporate Liabilities", *Journal of Political Economy*, May/June (1997), and Robert C. Merton, "Theory of Rational Option Pricing", *Bell Journal of Economics and Management Sciences*, 4 Spring (1973).

[9] 'Historical volatility' is also called 'actual volatility'. Our reader will be reminded that the three registers of reality in Deleuze's ontology are actual-potential-virtual.

[10]The best book on options for the nonspecialist is John C. Hull *Options, Futures, and Other Derivatives*, Prentice-Hall 2009. For this reason, on our reader's behalf we draw on Hull throughout Part IV.

[11] ('A derivative can be defined as a financial instrument whose value depends on (or derives from) the values of other, more basic, underlying variables. Very often the variables underlying derivatives are the prices of traded assets. A stock option, for example, is a derivative whose value is dependent on the price of a stock. However, derivatives can be dependent on almost any variable, from the price of hogs to the amount of snow falling as a certain ski resort.') Hull pg. 1; and ('A derivative is a security whose price ultimately depends on that of another asset (called underlying). There are different categories of derivatives, ranging from something as simple as a future to something as complex as an exotic option, with all shades in between.')Taleb pg. 9

[12] Ibid pg. 20

[13] Hull (2009) defines a conventional package ('A package is a portfolio consisting of standard European calls, standard European puts, forward contracts, cash, and the underlying asset itself.') pg. 555. We will ultimately wish to tailor this general concept to include an individual's total portfolio of assets –generic and synthetic, comprised of exotic options and CLNs, as well as the synthetic assets whose total notional value comprises an individual's universal synthetic portfolio, which is why we have neologized the term herein.

[14] Myron Scholes, "Derivatives in a Dynamic Environment", *The American Economic Review*, Vol. 88, No.3, June 1988 pg. 351

[15] Emanuel Derman and Nassim Nicholas Taleb, "The Illusions of Dynamic Replication", first draft Apr. 1995

[16] ('A delta is expressed as the first mathematical derivative of the product with respect to the underlying asset. [This] means that it is the hedge ratio of the asset *for an infinitely small move*. Somehow, when the portfolio includes more than one option, with a combination of shorts and longs, delta and hedge ration start parting ways.') Taleb pg. 115

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